

**Remarks**

Claims 18, 21, 22, 24, 25, 32, 33, 35 and 36 have been allowed in the instant application. By this amendment Applicants submit new claims 41 to 64 which are respectfully submitted to be allowable on the same basis as claims that have been allowed.

In the accompanying submission under 41 C.F.R. §202(a), Applicants suggest the declaration of an interference with the claims of US 6,200,451, 6,544,397, and 7,267,259 assigned to MacDermid.

**I. Status of This Application in the PTO**

Pursuant to Applicants' suggestion of interference, Interference No. 105,738 was declared March 1, 2010 between claims 32, 33, 35 and 36 of the instant application and the claims of MacDermid US patents 6,444,109 and 6,905,587.

In its decision of March 29, 2011, the Board of Patent Appeals and Interferences awarded priority to Applicants' claims 32, 33, 35 and 36 over claims 1-8 of the MacDermid '109 patent and claims 1-8 of the MacDermid '397 patent.

During the interference, on April 22, 2010, Enthone had filed its Motion List, indicating that Enthone wished to add MacDermid's '451, '397, '587, and '259 patents to the interference. At an April 26, 2010 conference call with the Board to discuss the parties' Motions List, the Board suggested that Enthone file a motion to add MacDermid's '587 patent to the interference and a motion to declare an additional interference between Enthone's '936 application and MacDermid's '451, '397, and '259 patents. On June 7, 2010, following the Board's suggestion, Enthone filed these two motions as Substantive Motion 2 and Miscellaneous Motion 1, respectively. On March 29, 2011, the Board granted Enthone's Substantive Motion 2, and

dismissed Enthone's Miscellaneous Motion 1 without prejudice, advising Enthone to renew its suggestion of interference before the examiner.

The claims of the MacDermid '451, '397 and '259 patents are very closely related to the claims of the '109 and '587 patents over which the Board of Patent Appeals and Interferences has now awarded priority to Applicants. The MacDermid '451, '397 and '259 patents derive from the same priority applications on which the '109 and '587 were based, and the claims of the instant continuation application are based on the same priority applications on which Applicants were awarded priority over the '109 and '587 patents.

Thus, in the accompanying submission under 41 C.F.R. §202(a)(4), Applicants -- at the Board's suggestion -- are renewing their suggestion of interference with the claims if the MacDermid '451, 397, and '259 patents.

## **II. New Claims 41-64**

New claims 41-52 are product-by-process claims directed to printed circuit boards prepared according to the process of claims 32, 33, 35 and 36.

New claims 53-64 are product-by-process claims directed to printed circuit boards prepared according to the process of claims 18, 19, 21, and 22 using the composition of claims 24 and 25.

Support for claims 41-64 is demonstrated in the Table set out below:

<b>Applicants' claim</b>	<b>Support in specification S.N. 10/099,936</b>
41. A printed circuit board having metal pads, metal through holes or combination thereof, the metal pads, metal through-holes or	Page 11, lines 1-5: "In accordance with the present invention, there is provided a method for coating a PCB comprising an insulating

<p>combination thereof</p> <p>being formed of copper and comprising an immersion silver plate thereon,</p> <p>the surface of said silver plate having been treated with a solution comprising an additive selected from the group consisting of</p> <p>fatty amines,</p> <p>fatty amides,</p> <p>quaternary salts, and</p> <p>ethoxylated versions of any</p>	<p>layer and a conducting layer, with metal pads and/or through-holes in which the pads and/or through-holes are provided with an anti-tarnish coating."</p> <p>¶Page 14, lines 5-13: "The plating step is an immersion (or displacement) plating step. In an immersion plating step, the plating composition comprises metal ions of a metal which is more electropositive than the conducting material. ... Since the pads or through-holes generally comprise copper or nickel, suitable examples of plating metals include bismuth, tin, palladium, silver and gold; silver and bismuth ions are particularly preferred."</p> <p>Page 16, line 24: "Alternatively, the metal surfaces are formed in the plating step and subsequently the formed metal surfaces are contacted with a solution comprising a tarnish inhibitor in a further step."</p> <p>p. 22, line 10: "fatty acid amines."</p> <p>Page 22, line 13: "amides" listed as type of fatty acid amine.</p> <p>Page 22, line 14: "quaternary ammonium salts."</p> <p>Page 22, lines 14-15: "ethoxylated quaternary ammonium salts, ethoxylated</p>
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of the foregoing.	amides."
42. The printed circuit board as set forth in claim 41 comprising components attached to silver plated copper metal pads and/or through holes thereof.	Page 27, lines 14-19: "In the subsequent component-attachment stage, the components are soldered onto the plated pads and/or through-holes of the bare board. The metal of the pad(s) and/or through-holes (generally copper) and plating metal, usually silver, and/or the plating metal and solder may tend to intermix. The bond formed with the components has good electrical conductivity and good bond strength."
43. The printed circuit board as set forth in claim 42, said components having been attached subsequent to treating of said silver plated copper metal pads with said solution comprising said additive.	<p>Page 17, line 26 to Page 18, line 8: "The solution comprising the tarnish inhibitor may be a final rinse solution, applied to the boards prior to drying of the boards. The board may undergo subsequent treatment steps after contact with the composition comprising tarnish inhibitor. However, generally, after contact with the solution, comprising a tarnish inhibitor and drying, they are at the end of the first bare board manufacturing stage, and are ready for the second component-attachment stages. Optionally, for example, there may be a deionized water rinse step, prior to drying."</p> <p>Page 27, lines 2-5: "After contact of the bare board with the solution comprising tarnish inhibitor, the board is dried. Preferably, there will be no post-rinse step</p>

	<p>between contact of the board with the solution and drying."</p> <p>Page 27, lines 14-19: "In the subsequent component-attachment stage, the components are soldered onto the plated pads and/or through-holes of the bare board. The metal of the pad(s) and/or through-holes (generally copper) and plating metal, usually silver, and/or the plating metal and solder may tend to intermix. The bond formed with the components has good electrical conductivity and good bond strength."</p>
44. The printed circuit board as set forth in claim 42 wherein said component(s) are selected from the group consisting of resistors and transistors.	<p>Page 1, lines 11-13: "There are currently two types of components for attachment to the bare boards in the second stage referred to above: legged components e.g. resistors, transistors, etc."</p>
45. The printed circuit board as set forth in claim 43 wherein said component(s) are selected from the group consisting of resistors and transistors.	<p>Page 1, lines 11-13: "There are currently two types of components for attachment to the bare boards in the second stage referred to above: legged components e.g. resistors, transistors, etc."</p>
46. The printed circuit board as set forth in claim 41 comprising a bare board.	<p>Page 10, lines 21-24: "The present invention aims to provide an alternative to the solder protection coating for the copper or other conducting surfaces of bare boards which require protection from tarnishing between bare board manufacture and the component-attachment stage."</p> <p>Page 13, line 26 to Page 14,</p>

	line 2: "Generally after the etching step, there will be a post-rinse step comprising rinsing with deionized water and generally without drying, the bare boards then proceed directly to the plating step."
<p>47. The printed circuit board as set forth in claim 41 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazoles."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>48. The printed circuit board as set forth in claim 42 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p>

imidazole derivatives, and	Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."
benzimidazole derivatives.	Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."
49. The printed circuit board as set forth in claim 43 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of	
imidazoles,	Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."
benzimidazoles,	Page 23, line 8: "benzimidazoles."
imidazole derivatives, and	Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."
benzimidazole derivatives.	Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."
50. The printed circuit board as set forth in claim 44 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of	
imidazoles,	Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."
benzimidazoles,	Page 23, line 8: "benzimidazoles."
imidazole derivatives, and	Page 23, lines 4-7: "undecyl

<p>benzimidazole derivatives.</p>	<p>imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>51. The printed circuit board as set forth in claim 45 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>52. The printed circuit board as set forth in claim 46 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the</p>



<p>benzimidazole derivatives.</p>	<p>alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>53. A printed circuit board having metal pads, metal through holes or combination thereof, the metal pads, metal through-holes or combination thereof</p> <p>being formed of copper and comprising an immersion silver plate thereon, the silver plate having been formed by a process comprising treating the metal surface with an immersion silver plating solution comprising a soluble source of silver ions,</p> <p>an acid,</p>	<p>Page 11, lines 1-5: "In accordance with the present invention, there is provided a method for coating a PCB comprising an insulating layer and a conducting layer, with metal pads and/or through-holes in which the pads and/or through-holes are provided with an anti-tarnish coating. ..."</p> <p>Page 14, lines 5-13: "The plating step is an immersion (or displacement) plating step. In an immersion plating step, the plating composition comprises metal ions of a metal which is more electropositive than the conducting material. ... Since the pads or through-holes generally comprise copper or nickel, suitable examples of plating metals include bismuth, tin, palladium, silver and gold; silver and bismuth ions are particularly preferred."</p> <p>Page 24, lines 10-12: "A suitable pH for a silver plating composition may be from 2 to 12, but is preferably from 4 to 10. Thus, the composition may be acidic, up to pH 7."</p> <p>Page 24, lines 15-17: "A buffering agent may be included in the plating composition to ensure that</p>

<p>and an additive selected from the group consisting of</p> <p>fatty amines,</p> <p>fatty amides,</p> <p>quaternary salts, and</p> <p>ethoxylated versions of any of the foregoing.</p>	<p>the pH of the composition is within the desired range. As the buffering agent, any compatible acid or base may be included."</p> <p>p. 22, line 10: "fatty acid amines."</p> <p>Page 22, line 13: "amides" listed as type of fatty acid amine.</p> <p>Page 22, line 14: "quaternary ammonium salts."</p> <p>Page 22, lines 14-15: "ethoxylated quaternary ammonium salts, ethoxylated amides."</p>
<p>54. The printed circuit board as set forth in claim 53 comprising components attached to silver plated copper metal pads and/or through holes thereof.</p>	<p>Page 27, lines 14-19: "In the subsequent component-attachment stage, the components are soldered onto the plated pads and/or through-holes of the bare board. The metal of the pad(s) and/or through-holes (generally copper) and plating metal, usually silver, and/or the plating metal and solder may tend to intermix. The bond formed with the components has good electrical conductivity and good bond strength."</p>
<p>55. The printed circuit board as set forth in claim 54, said components having been attached subsequent to immersing copper metal pads in said plating solution comprising said additive.</p>	<p>Page 27, lines 14-19: "In the subsequent component-attachment stage, the components are soldered onto the plated pads and/or through-holes of the bare board. The metal of the pad(s) and/or through-holes</p>

	(generally copper) and plating metal, usually silver, and/or the plating metal and solder may tend to intermix. The bond formed with the components has good electrical conductivity and good bond strength."
56. The printed circuit board as set forth in claim 54 wherein said component(s) are selected from the group consisting of resistors and transistors.	Page 1, lines 11-13: "There are currently two types of components for attachment to the bare boards in the second stage referred to above: legged components e.g. resistors, transistors, etc."
57. The printed circuit board as set forth in claim 55 wherein said component(s) are selected from the group consisting of resistors and transistors.	Page 1, lines 11-13: "There are currently two types of components for attachment to the bare boards in the second stage referred to above: legged components e.g. resistors, transistors, etc."
58. The printed circuit board as set forth in claim 53 comprising a bare board.	<p>Page 10, lines 21-24: "The present invention aims to provide an alternative to the solder protection coating for the copper or other conducting surfaces of bare boards which require protection from tarnishing between bare board manufacture and the component-attachment stage."</p> <p>Page 13, line 26 to Page 14, line 2: "Generally after the etching step, there will be a post-rinse step comprising rinsing with deionized water and generally without drying, the bare boards then proceed directly to the plating step."</p>
59. The printed circuit board as set forth in claim 53 wherein said silver plate has been deposited from a	

<p>silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>60. The printed circuit board as set forth in claim 54 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>61. The printed circuit board as set forth in claim 55 wherein said silver plate has been deposited from a silver immersion plating</p>	

<p>solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>62. The printed circuit board as set forth in claim 56 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>63. The printed circuit board as set forth in claim 57 wherein said silver plate has been deposited from a silver immersion plating solution comprising a</p>	

<p>material selected from the group consisting of</p> <p>imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>
<p>64. The printed circuit board as set forth in claim 58 wherein said silver plate has been deposited from a silver immersion plating solution comprising a material selected from the group consisting of imidazoles,</p> <p>benzimidazoles,</p> <p>imidazole derivatives, and</p> <p>benzimidazole derivatives.</p>	<p>Page 23, line 4: "alkyl benzyl imidazoles, e.g. undecyl imidazole."</p> <p>Page 23, line 8: "benzimidazoles."</p> <p>Page 23, lines 4-7: "undecyl imidazole ... in which the alkyl or benzyl groups are optionally substituted."</p> <p>Page 23, line 11: "2-(p-chlorobenzyl) benzimidazole."</p>

### III. Suggestion of Interference

The accompanying Suggestion of Interference with US 6,200,451, 6,544,397 and 7,267,259 explains the basis for interference-in-fact between claims 1 to 6 of the instant

application and the claims of the MacDermid '451, '397 and '259 patents.

#### **IV. Civil Action Under 35 U.S.C. §146**

On May 2, 2011, MacDermid, the losing party in Interference No. 105,738, filed an action in the U.S. District Court for the District of Connecticut under 35 U.S.C. §146 seeking judicial review and reversal of the decision of the Board of Patent Appeals and Interferences awarding priority to the instant application and revoking the claims of MacDermid US patents 6,444,109 and 6,905,587.

Enthone has filed a counterclaim seeking an order instructing the Board to declare an interference between claims 18, 19, 21, 22, 24 and 25 of this instant application and the claims of MacDermid US patents 6,200,451, 6,544,397 and 7,267,259.

It is respectfully submitted that the pendency of the §146 litigation does not bar the PTO from proceeding according to the Board's order to entertain a renewed suggestion of interference between claims 18, 19, 21, 22, 24 and 25 vs. the MacDermid '451, '397 and '259 patents. While it cannot be predicted at this point how rapidly the U.S. District Court action will proceed to disposition, parallel proceeding in the PTO is respectfully submitted to be appropriate because a favorable decision by the PTO on Applicant's accompanying renewed suggestion of interference will simply moot the Enthone counterclaim and expedite resolution of the long standing interference-in-fact between the Enthone claims and the MacDermid claims to a process in which a fatty amine, fatty amide, quaternary ammonium salt, or ethoxylated or propoxylated versions of these is incorporated into the silver immersion plating solution.

## **V. Parallel Applications**

In order to minimize the potential for delay, applicant has also filed Ser. No. 13/092,631 (Attorney Docket No. CEDE 2135.13), containing product-by-process claims 1-12 which correspond to product-by-process claims 41-52 of the instant application, and Ser. No. 10/562,882 (Attorney Docket No. CEDE 2135.14) which contain process claims 1 to 6 that correspond to process claims 18, 19, 21, 22, 24 and 25 of the instant application, and product-by-process claims 7-18 which correspond to product-by-process claims 53 to 64 of the instant application.

### **A. Co-ordination of Examination**

Applicants do not seek duplicate or potentially conflicting examination of the same claims as appearing in the instant '936 application and either the '631 or '882 application. Preferably, one and the same Examiner should be assigned to examine both claims 41-52 herein and claims 1-12 of '631; and one and the same Examiner should also be assigned to examine both claims 18, 19, 21, 22, 24, 25 and 53-64 of the instant application and claims 7-18 of '882. Short of that, the Examiners of the respective claims obviously should co-ordinate their review.

Applicants' undersigned attorney will co-operate in whatever administrative logistics are required to expedite *ex parte* examination of these claims. But because of the extensive delay already suffered by Applicants in originally achieving allowance of claims 32, 33, 35 and 36, and rapidly shrinking remainder of the term of a patent issuing with the subject matter of claims 41-64, the Office is respectfully urged to take whatever administrative options are available to expedite *ex parte* examination either to the point of grant, or to the point where grant



may be realized promptly upon the resolution of the related §146 litigation.

**B. Double Patenting**

Double patenting issues will be avoided by canceling the claims from either this case or '936 whenever the other case is in condition for grant except for double patenting.

**VI. Conclusion**

Claims 18, 19, 21, 22, 24 and 25 stand allowed, and it is respectfully submitted that claims 53 to 64 are allowable on the same basis as claims 18, 19, 21, 22, 24 and 25. It is further respectfully submitted that claims 41 to 52 are allowable on the same basis as claims 32, 33, 35 and 36, the claims to which priority was awarded over MacDermid US patents 6,444,109 and 6,905,587.

Pursuant to the accompanying suggestion filed under 41 C.F.R. §202(a) and (d), it is respectfully submitted that an interference should be declared between claims 18, 19, 21, 22, 24 and 25 and MacDermid's US patents 6,200,451, 6,544,397 and 7,267,259.

Respectfully submitted,

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